

### **AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) In a system recording and playing back a transport stream transmitted by a digital broadcast, a digital video record/playback apparatus comprising:

an output control unit configured to output a predetermined playback mode;

a transmission control unit configured to control a transmission bit rate and transmission time point of the transport stream based on the predetermined playback mode and buffer status information;

a demux configured to perform a STC (system time clock) count initialization on a PCR (program clock reference) packet of the transport stream inputted via the transmission control unit, the demux configured to synchronize the STC count with a STC, the demux further configured to extract ES (elementary stream) data for a program data packet of the transport stream;

a buffer configured to temporarily store the extracted ES data, the VBV buffer configured to play a role in buffering between the transmission bit rate and a decoding frame rate, the buffer configured to output a buffer status to the transmission control unit; and

a decoder configured to adjust DTS (decoding timestamp) according to the predetermined playback mode of the output control unit, the decoder configured to control a decoding time point by comparing a difference between the adjusted DTS and the STC count value to a reference time and decoding the ES data outputted from the buffer,

wherein the decoder is configured to calculate a difference between the DTS and a DTS value of a first picture at a beginning of a predetermined trick play and adjust the DTS according to the calculated difference and the predetermined playback mode.

2. (Previously Presented) The apparatus of claim 1, wherein the transmission control unit

$$R_n = \frac{B - B_n}{t_{n+1} - t_n}, \quad \text{if } R_n \leq R_{t \max}$$

adopts an equation of {

$$R_{t \max}, \quad \text{if } R_n > R_{t \max}$$

} to control the transmission bit rate  $R_n$  in case of a normal playback mode and wherein  $t_{n+1} - t_n$  is a decoding cycle,  $B - B_n$  is a vacant quantity of the buffer, and  $R_{t \max}$  is a maximum transmission bit rate.

3. (Currently Amended) The apparatus of claim 1, wherein the transmission control unit is configured to control the decoding time point by adjusting the DTS by adopting an equation of

$$\begin{cases} DTS'_n = DTS_0, & n = 0 \\ DTS_0 + \frac{DTS_n - DTS_0}{N}, & n \neq 0 \end{cases} \quad \text{in case of an N-times speed forward trick}$$

play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_0$  is a DTS value of a first picture at the beginning of a trick ~~play~~ the first picture.

4. (Previously Presented) The apparatus of claim 1, wherein the transmission control unit is configured to control the decoding time point by adjusting the DTS by adopting an equation of

$$\begin{cases} DTS'_n = DTS_L, & n = 0 \\ DTS_L + \frac{DTS_L - DTS_n}{N}, & n \neq 0 \end{cases} \quad \text{in case of an N-times speed reverse trick}$$

play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_L$  is a DTS value of a first I picture at the beginning of a reverse trick play.

5. (Previously Presented) The apparatus of claim 1, wherein the transmission control unit is configured to output a PCR value of a next picture following a picture to be played back as a PCR value to be transmitted for the STC count initialization in case of an N-times speed reverse trick play mode.

6. (Previously Presented) The apparatus of claim 1, wherein if a playback mode and a first picture to be played back are determined, the demux is configured to initialize the STC count becoming a reference of the decoding time point with a PCR value of the determined picture and the STC count is then synchronized with the STC according to a playback direction to be sequentially incremented or decremented.

7. (Previously Presented) The apparatus of claim 1, wherein the decoder is configured to sequentially increment the STC count in case of a forward trick play or sequentially decrement the STC count in case of a reverse trick play.

8. (Currently Amended) A digital video record/playback apparatus, comprising:

- a record control unit configured to only select transport packets corresponding to a program to be stored in a transport stream, the record control unit configured to extract picture information and PCR (program clock reference) of the program to be used in playback;
- a storage medium configured to store the transport packets of the program selected in the record control unit, the picture information, and the PCR of the selected program;
- an output control unit configured to output a predetermined playback mode;

a transmission control unit configured to control a transmission bit rate and transmission time point of the transport stream based on the predetermined playback mode and buffer status information;

a demux configured to perform a STC (system time clock) count initialization on a PCR (program clock reference) packet of the transport stream inputted via the transmission control unit, the demux configured to synchronize the STC count with a STC, the demux further configured to extract ES (elementary stream) data for a program data packet of the transport stream;

a buffer configured to temporarily store the extracted ES data, the buffer configured to play a role in buffering between the transmission bit rate and a decoding frame rate, the buffer configured to output a buffer status to the transmission control unit; and

a decoder configured to adjust DTS (decoding timestamp) according to the predetermined playback mode of the output control unit, the decoder configured to control a decoding time point by comparing a difference between the adjusted DTS and the STC count to a reference time and decoding the ES data outputted from the buffer,

wherein the decoder is configured to calculate a difference between the DTS and a DTS value of a first picture at a beginning of a predetermined trick play and adjust the DTS according to the calculated difference and the predetermined playback mode.

9. (Previously Presented) The apparatus of claim 8, wherein the record control unit is configured to store information of a location where a picture is stored, information of a location where a PCR value of the picture is stored, and each picture type in the storage medium, wherein the record control unit stores associative relation to the location information of the picture recorded in the storage medium by searching index information of the picture type, and wherein a time stamp is not stored in the storage medium.

10. (Previously Presented) The apparatus of claim 8, wherein the storage medium has a capacity sized to store digital video streams and is randomly accessible.

11. (Previously Presented) The apparatus of claim 8, wherein the transmission control

$$R_n = \frac{B - B_n}{t_{n+1} - t_n}, \quad \text{if } R_n \leq R_{t\max}$$

unit adopts an equation of {

$$R_{t\max}, \quad \text{if } R_n > R_{t\max}$$

} to control the transmission

bit rate  $R_n$  in case of a normal playback mode and wherein  $t_{n+1}-t_n$  is a decoding cycle,  $B-B_n$  is a vacant quantity of the buffer, and  $R_{t\max}$  is a maximum transmission bit rate.

12. (Currently Amended) The apparatus of claim 8, wherein the transmission control unit is configured to control the decoding time point by adjusting the DTS by adopting an equation of

$$\begin{aligned} DTS'_n = & DTS_0, & n = 0 \\ \{ & & \} \text{ in case of an N-times speed forward trick} \\ & DTS_0 + \frac{DTS_n - DTS_0}{N}, & n \neq 0 \end{aligned}$$

play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_0$  is a DTS value of ~~a first picture at the beginning of a trick play~~ the first picture.

13. (Previously Presented) The apparatus of claim 8, wherein the transmission control unit is configured to control the decoding time point by adjusting the DTS by adopting an

$$\begin{aligned} DTS'_n = & DTS_L, & n = 0 \\ \text{equation of } \{ & & \} \text{ in case of an N-times speed} \\ & DTS_L + \frac{DTS_L - DTS_n}{N}, & n \neq 0 \end{aligned}$$

reverse trick play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_L$  is a DTS value of a first I picture at the beginning of a reverse trick play.

14. (Previously Presented) The apparatus of claim 8, wherein the transmission control unit is configured to output a PCR value of a next picture following a picture to be played back as a PCR value to be transmitted for the STC count initialization in case of an N-times speed reverse trick play mode.

15. (Previously Presented) The apparatus of claim 8, wherein if a playback mode and a first picture to be played back are determined, the demux is configured to initialize the STC count becoming a reference of the decoding time point with a PCR value of the determined picture and the STC count is then synchronized with the STC according to a playback direction to be sequentially incremented or decremented.

16. (Previously Presented) The apparatus of claim 8, wherein the decoder is configured to sequentially increment the STC count in case of a forward trick play or sequentially decrement the STC count in case of a reverse trick play.

17. (Currently Amended) A playback method in a digital video record/playback apparatus, comprising:

a step (a) of storing transport packets of a selected program, picture information, and a PCR (program clock reference) of the selected program;

a step (b) of performing a STC (system time clock) count initialization using a value of the stored PCR and synchronizing the STC count with a STC according to a direction of a trick play mode;

a step (c) of adjusting a DTS (decoding timestamp) of a picture to be decoded according to the direction and multiple-times speed of the trick play mode; and

a step (d) of decoding to output picture data of the selected program by controlling a decoding time point by comparing a difference between the adjusted DTS and the STC count to a reference value and by referring to the picture information according to the trick play mode,

wherein the step (d) includes calculating a difference between the DTS and a DTS value of a first picture at a beginning of a predetermined trick play and adjusting the DTS according to the calculated difference and the predetermined playback mode.

18. (Original) The playback method of claim 17, wherein in the step (b), the STC count is sequentially incremented in case of a forward trick play or sequentially decremented in case of a reverse trick play.

19. (Currently Amended) The playback method of claim 17, wherein in the step (c), the decoding time point is controlled by adjusting the DTS by adopting an equation of

$$\begin{aligned} DTS'_n &= DTS_0, & n &= 0 \\ \{ & & & \} \text{ in case of an N-times speed forward trick} \\ DTS_0 + \frac{DTS_n - DTS_0}{N}, & n &\neq 0 \end{aligned}$$

play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_0$  is a DTS value of ~~a first picture at the beginning of a trick play~~the first picture.



20. (Original) The playback method of claim 17, wherein the decoding time point is controlled by adjusting the DTS by adopting an equation of

$$\begin{cases} DTS'_n = DTS_L, & n = 0 \\ DTS_L + \frac{DTS_L - DTS_n}{N}, & n \neq 0 \end{cases} \text{ in case of an N-times speed reverse trick}$$

play mode and wherein  $DTS'_n$  is a new DTS value corresponding to the decoding time point and  $DTS_L$  is a DTS value of a first I picture at the beginning of a reverse trick play.